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ABSTRACT

This paper examines the charges made in the highly publicized report, "How Schools Shortchange Girls," published by the American Association of University Women (1992). The paper shows how the findings in this report are based on a selective review of the research and how findings contrary to the report's message were suppressed. The paper reviews the best available information on a variety of measures to see how boys and girls fare in the schools. Such measures as school grades, class rank, honors and prizes in academic competitions, scores on standardized achievement tests, college entrance and graduation rates, and attainment of professional and doctoral degrees are considered. The paper questions the interpretations of much of the data and concludes that research on gender differences in class participation, school climate, and self-confidence provides a welter of conflicting findings, sometimes favoring girls, sometimes favoring boys, and sometimes showing no gender differences at all. The paper charges political propaganda was used in the findings that schools shortchange girls. The paper contends that such a "noble lie" (Plato) draws attention away from the group that schools actually do fail, that of African-American males, who fall far behind African-American females in educational success. The paper questions the distortion that masks the educational progress women have made and focuses on goals of raising self-esteem of teen-age girls, instead of goals of increasing performance of students on international tests in mathematics and science. (EH)

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The Myth That Schools Shortchange Girls:

Social Science in the Service of Deception

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Women's advocacy groups have waged an intense media campaign to promote the idea that the "schools shortchange girls. " Their goal is to intensify the image of women as "victims" deserving special treatment and policy attention. Their sophisticated public relations campaign has succeeded. The idea that girls are victimized by the schools has become the common wisdom, what educated people just assume to be true.

But the idea that the "schools shortchange girls" is wrong and dangerously wrong. It is girls who get higher grades in school, who do better than boys on standardized tests of reading and writing, and who get higher class rank and more school honors. It is young women who enter and graduate from college far more frequently than young men. It is women who have made dramatic progress in obtaining professional, business, and doctoral degrees. The great gender gap of the 1960s in advanced degrees has almost closed, especially in the professional fields to which ambitious women aspire. In the view of elementary and high school students, the young people who sit in the classroom year after year and observe what is going on, both boys and girls agree: Schools favor girls. Teacher think girls are smarter, like being around them more, and hold higher expectations for them.

This does not mean that males and females are equal on every educational outcome. In some areas, females do better than males, and in other areas, males do better than females. Females lag behind in two academic areas: mathematics and science achievement. Females also lag slightly behind males in attaining professional, business, and doctoral degrees. But males lag behind females in two other academic areas and by far wider margins: reading achievement and writing skills. Males are far more apt to end up at the bottom of the barrel in school, placed in special classes for students with learning disabilities. Males are also more apt than females to believe that the school climate is hostile to them, that teachers do not expect as much from them and give them less encouragement to do their best.

The myth that the schools shortchange girls is dangerously wrong because it has diverted policy attention from the group at genuine educational risk—African-American boys. This is the group that scores lowest on virtually every educational measure. This is the group where an enormous gap does exist between males and females. But the African-American gender gap favors females, who are pulling far ahead of males in college graduation rates and in obtaining professional degrees.

Where did the notion that the schools shortchange girls come from? And how do advocacy groups manage to convince people that it is girls who are victimized in the schools? What data do they use and what data do they ignore?

In this paper, I examine the charges made in a highly publicized report, *How Schools Shortchange Girls,* published by the American Association of University Women (1992). I show how the findings in this report are based on a selective review of the research and how findings contrary to the report's message were suppressed. These contrary findings indeed appear in studies the AAUW itself commissioned, but the AAUW not only did not include these findings in their media kits but made the data difficult to obtain.

To find out what is actually going on, how boys and girls do fare in the schools, I review the best available information on a wide variety of strong measures: school grades, class rank, honors and prizes in academic competitions, scores on standardized achievement tests, college entrance and graduation rates, and attainment of professional and doctoral degrees. To locate this information, I often had to do new analyses of government reports, which also emphasize the "women as victims" viewpoint—showcasing the problems but not the progress. I examine as well charges that the schools shortchange girls based on weak measures, the view that girls are silenced in the classroom and suffer a dramatic loss of self-confidence at adolescence. I show that the research on which these charges are based have in some instances disappeared and in other instances have been distorted to make a political point. Research on gender differences in class participation, school climate, and self-confidence provides a welter of conflicting findings, sometimes favoring girls, sometimes favoring boys, and sometimes showing no gender differences at all.

The AAUW Report: How Schools Shortchange Girls

The American Association of University Women (AAUW) put itself on the political map through its highly publicized 1992 report: *How Schools Shortchange Girls.* The media trumpeted the message around the world: In the schools, as in so many other areas of life, females are victims. Girls are silenced in the classroom, suffer a decline in self-esteem at adolescence, and fall far behind boys in such crucial subjects as science and mathematics. As the AAUW Executive Summary declares:

> The educational system is not meeting girls' needs. Girls and boys enter school roughly equal in measured ability. Twelve years later, girls have fallen behind their male classmates in key areas such as higher-level mathematics and measures of self-esteem. Yet gender equity is still not a part of the national debate on educational reform. (p. 1)

The AAUW provides a glossy order form for this report. The form features a photograph of a classroom peopled with attractive girls and boys from many groups—an African-American girl, an African-American boy, an Asian girl, a Caucasian boy. The irony is that there is one child in this photograph whom the schools are shortchanging, but this child is not a girl. This child is the African-American boy. This is the group in need of creative policy initiatives.

What is worth remembering is that boys used to be the group considered shortchanged by the schools. The idea that the schools shortchanged boys was part of the common wisdom through the 1970s. As Brophy (1985) reminds us:

> Claims that one sex or the other is not being taught effectively in our schools have been frequent and often impassioned. From early in the century (Ayres, 1909) through about 1970 (Sexton, 1969; Austin, Clark, & Fitchett, 1971), criticism was usually focused on the treatment of boys, especially at the elementary level. Critics noted that boys received lower grades in all subjects and lower achievement test scores in reading and language arts. They insisted that these sex differences occurred because the schools were "too feminine" or the "overwhelmingly female" teachers were unable to meet boys' learning needs effectively. (pp. 115-116)

As this paper documents, girls surpass boys in some academic areas and boys surpass girls in other areas. Indeed, a far stronger case could be made for the view that "the schools shortchange boys" than the other way around. After all, it is boys who get consistently lower grades in school even though they score just as high or higher than girls on many standardized tests of achievement. This is strong evidence of bias against boys. It is boys who end up far more often than girls in special education classes for students with serious learning problems. It is males who are falling behind in college attendance. As recent survey research shows, it is boys , especially minority boys, who believe that teachers are not as apt to encourage them to achieve their goals or do their best (Harris, 1997, pp. 10, 13).

The AAUW has done women and the nation a service in drawing attention to the gender gap in science and mathematics and in encouraging an array of policies and programs designed to boost female performance in these fields. But the schools need to be equally concerned about the problems of boys. Boys mature more slowly than girls, for example, in areas like verbal skills. Late-maturing boys can be stigmatized as poor learners and assigned to "low-ability groups in the primary grades, especially in reading" (Halpern, 1997, p. 1098). Boys are also more active than girls and more difficult for teachers to handle. "Bright, bored, and rambunctious boys" have been diagnosed with attention deficit disorder and placed on drugs like Ritalin (Zachary, 1997, A1).

Neither girls nor boys nor the nation itself are served by politicized research and "noble lies." Major assertions in the AAUW report are based on research by David and Myra Sadker that has mysteriously disappeared. Evidence which contradicts their thesis that the schools shortchange girls is buried in supplemental tables obtainable only at great difficulty and expense. Such shady practices undermine public confidence in social science research. This damage done by the AAUW report will have repercussions that last far beyond the immediate issue of whether either girls or boys are shortchanged in the school.

Gender Differences in School Grades, Rank in Class, and Honors

If schools as an institution were shortchanging females, such gender discrimination should be easy to spot. Schools give clear and measurable rewards: grades, class rank, and honors. These rewards are valuable in gaining admission to a selective college or graduate school and in gaining a desirable job. Which group—males or females—receives a disproportionate share of the school's rewards?

From grade school through college, females receive higher grades and obtain higher class ranks. They also receive more honors in every field except science and sports.

Grades: That females receive higher grades in virtually every subject is undisputed. In reviewing the literature on gender differences in cognitive tests, for the flagship journal of the field, *American Psychologist*, Halpern (1997, p. 1102) points out that "higher grades in school, all or most subjects" is an area of unquestioned female advantage. Another recent, comprehensive review of the research literature on gender differences in school performance comes to the same conclusion:

> Data from a wide variety of sources and educational settings show that females in all ethnic groups tend to earn higher grades in school than do males, across different ages and eras, and across different subject matter disciplines. Many researchers in past times and today consider this to be such an obvious fact that they treat it as axiomatic....Modern reviews of the subject are unanimous in their finding of higher grades for females (Dwyer & Johnson, 1997, pp. 128-129).

The female advantage in grades, while consistent, is not necessarily large. Among high school students who took the ACT in 1992, for example, the overall female GPA was 3.00; the overall male GPA was 2.89 (Willingham & Johnson, 1997, Table S-14). Even in mathematics and in science, female high school students who took the ACT got higher grades than males.

In college, females also receive higher grades than males, a pattern evident in national samples from the 1970s that continues into the 1990s . Table 1 shows the pattern.

Table 1: Women Get Higher College Grades But Differences Are Small

Major	Women's GPA	Men's GPA
All Majors	3.07	2.92
Engineering/Computer Science	3.17	2.96
Science/Math	3.18	2.98
Business	2.96	2.79
Education	3.05	2.89
Humanities	3.16	3.10
Social Sciences	3.08	2.95
Arts	3.13	3.08

Source: From *Women at Thirtysomething* (p.114), by C. Adelman, 1991, Washington, DC: U.S. Department of Education.

Class Rank and Honors: Since girls receive higher grades in school, they should also surpass boys in class rank. This is exactly what happens. Examining gender differences in high school class rank and honors in a nationally representative sample from the 1970s, Adelman (1991, p. 3) makes this point, "No matter how one slices the high school class of 1972, women's mean class rank exceeded that of men by a minimum of 10 points." Caucasian women attained, on the average, the highest class rank (67th percentile), while African-American men attained, on the average the lowest class rank (44th percentile). African-American women ranked far higher (56th percentile) than African-American men.

The same pattern of female advantage in grades and honors shows up in the 1990s, in a nationally representative longitudinal study of the high school class of 1992 (NELS Second Follow-up, cited in Dwyer & Johnson, 1997, p. 139). In the academic arena, high school girls outdistanced boys in making the honor roll, in getting elected to a class office, and in receiving writing awards and other academic honors. In the academic arena, boys outdistanced women in vocational-technical honors and in awards in science and mathematics competitions.

While males are still ahead in gaining mathematics and science honors, females are making strong gains. From 1995-1998, close to 40 percent of the winners of the most prestigious science competition, the Westinghouse Science Talent Search, were female (Science Service, 1998). The Westinghouse Science Talent Search requires high school students to complete a project in science, mathematics, and engineering and submit a report communicating the results. The work goes on over many months, often with the assistance of a parent, teacher, or other researcher. The contest is notable for producing winners who later go on to win a Nobel Prize. Westinghouse finalists from the 1940s through the 1970s were overwhelmingly male. The number of females among the top 40 finalists has increased since the 1980s and is approaching parity (Table 2). [1]

Table 2: Females Are Increasing Among Westinghouse Science Finalists

Years	Females In Top 40 Finalists
1942-1949	26%
1950-1959	22%
1960-1969	26%
1970-1979	26%
1980-1989	31%
1990-1994	32%
1995-1998	39%

Source: Science Service, Westinghouse Foundation, 1998.

Gender Differences in Standardized Tests of School Achievement

Even though girls surpass boys in school grades, the schools might still be shortchanging girls if they are getting good grades but not learning as much as boys. Grades, after all, are based not only on how much students know but also on conformity to institutional demands, such as whether students follow the teacher's directions and turn in their assignments on time. Scores on standardized achievement tests provide a measure of school achievement less influenced by such extraneous influences as willingness to obey the teacher's directives.

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[1] In recent years, the proportion of high school females ending up in the top 40 has increased markedly, but 1998 was an unusually low year: 1995: 46% females in top 40; 1996: 38% females in top 40; 1997: 45% females in top 40; 1998: 25% females in top 40.

On standardized achievement tests, females typically surpass males in writing ability, reading achievement, and certain other verbal skills while males surpass females in science and mathematics. In the general population of males and females, however, sex differences in achievement tests are typically small—except for the big female advantage in writing.

The research literature on sex differences in achievement test scores is voluminous. Various studies use various standardized tests, for example, the California Achievement Test, the Iowa Test of Basic Skills, and the tests developed by the National Assessment of Educational Progress. Standardized test information is available in many different years in many different locations.

To make sense of this mass of information, contemporary researchers use a statistical technique called a "meta-analysis." (For those readers who prefer, a simpler version of the same basic pattern discussed in this section begins on page 15.) Essentially this technique offers a simple way to combine the findings from many different standardized tests, given to different samples in different years, and using different scoring systems. A statistical measure called the *standard mean difference (D)* summarizes and communicates the results across these studies.[2] This statistic is easy to understand. Basically, "*D* " is the average difference between the test scores females receive and the test scores males receive in an area like mathematics achievement. "*D*" is calculated simply by subtracting the male mean across all these tests from the female mean across all these tests, which yields the average difference in test scores between females and males. This difference is then divided by a measure of the variability (average standard deviation) in the test scores of females and males.

Using *D* allows researchers to combine studies and to come up with a strong estimate of the average difference between males and females. If females and males do not differ on the measure of intellectual performance, then *D* is zero. A positive *D* indicates a difference in favor of females. A negative *D* indicates a difference in favor of males. By convention, a *D* of .20 to .49 is considered a "small" difference; a *D* of .50 to .79 is considered to be a "medium" difference; and a *D* of .80 or higher is considered to be a "large" difference.

In a comprehensive review of the literature on gender differences on standardized test scores, Willingham, Cole, Lewis, & Leung (1997) bring order to this complex and disputed mass of studies. They have created a data set focusing on the performance of large national samples of 12th grade students on standardized tests, with emphasis on the National Assessment of Educational Progress. The core of their data base consists of about 60 achievement tests grouped into 10 different academic categories, such as 1) Verbal-writing, 2) Verbal-reading, 3) Math-concepts, and 4) Natural science.[3]

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[2] This discussion of the calculation of the standard mean difference and the statistical effects of differences in means and variability is summarized from the lucid presentation in Willingham & Cole (1997).

In most academic areas, sex differences in achievement, where they exist at all, are "small" (Table 3). Females surpass males in writing skills, language use, reading, and study skills. Males surpass females in mathematics, science, and geopolitics, but the differences are too slight to reach the accepted criterion of a "small" difference except in geopolitics.[4] The only gender difference approaching "medium size" occurred in writing skills, which favored females.

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[3] I do not report their results in five other areas because these are tests of special skills such as perceptual speed, spatial skills, or mechanical/electronic reasoning. The only large difference favored males in the area of mechanical/electronics (*D* = -.93). Males also surpassed females in spatial skills (*D* =-.14). Females surpassed males in perceptual speed (*D* = .31), short-term memory (*D* = .23), and abstract reasoning (*D* =.10).

[4] While girls on the average, lag behind boys in mathematics and science at the end of high school, this gap may be narrowing, at least in science. The National Assessment of Educational Progress (NAEP) has examined the knowledge of 9-13-, and 17-year-olds in different academic fields for over 20 years. In mathematics, the gender gap among 17-year-olds did decline between the 1970s and 1994, although this change is not statistically significant (Bae & Smith, 1997). "The gender gap in the science proficiencies of male and female 17-year-olds has narrowed over time," conclude Bae & Smith (1997, p. 15) on the basis of the NAEP results. The general pattern, however, is mixed with the gap growing and declining at different ages in different years.

Table 3: Standardized Achievement Test Scores Are More Apt to Favor Females But Most Differences Are Small : National Samples of Students at Grade 12

ACADEMIC AREA	*D*	Standard Error	Gender Favored	Size of Gender Difference
Writing	.57	(.018)	**Females**	**Medium**
Language Use	.43	(.022)	**Females**	**Small**
Reading	.20	(.011)	**Females**	**Small**
Vocab/Reasoning	.06	(.012)	---	---
MathComput.	.18	(.030)	---	---
Math Concepts	-.11	(.010)	---	---
Natural Science	-.17	(.014)	---	---
Social Science	.02	(.026)	---	---
Geopolitical	-.23	(.018)	**Males**	**Small**
Study Skills	.20	(.022)	**Females**	**Small**

Source: Adapted from *Supplement to Gender and Fair Assessment* (pp. 58-59) by W. W. Willingham and L. M. Johnson, 1997, Mahwah, NJ: Lawrence Erlbaum Associates.

In short, on these comparisons, across many different tests, not much difference occurs between males and females in achievement in standardized tests in the general population. Most gender differences are small and favor females more often than males. The only gender difference of medium size, writing abilities, favors females.

A simpler way of looking at the same, basic pattern is to examine male and female scores on the National Assessment of Educational Progress, tests given to a nationally representative sample of students to examine American students' performance in the four basic skill areas: reading, writing, mathematics, and science. At the end of high school, females vastly surpass males in writing abilities and reading abilities. Males surpass females in science and mathematics, but the male advantage in these subjects is far smaller than the female advantage in reading and writing.

Table 4: The Gender Gap Favoring Females in Reading and Writing Is More than Twice the Size of the Gender Gap Favoring Males in Science and Mathematics:

National Assessment of Educational Progress: End of High School (0-500)	Males	Females	Gender Favored	Size of Difference
Reading	279.9	294.4	**Females**	15 points
Writing	275	292	**Females**	17 points
Mathematics	310	305	**Males**	5 points
Science	300	292	**Males**	8 points

Source: From *Digest of Education Statistics 1997* (Tables 107, 113, 118, and 126), National Center for Education Statistics, 1997, Washington, DC: U.S. Department of Education.

To put these sex differences in perspective, consider the difference in each subject between Whites and Blacks. At age 17, in reading, Whites surpass Blacks by 29 points; in writing by 32 points; in mathematics by 27 points and in science by 47 points (National Center for Education Statistics [NCES], 1997 b, Tables 107, 113, 118, 126). The enormous achievement gaps in America concern race, not sex.

Sex differences on achievement tests are small among high school males and females in general. But let us ask a different and equally significant question: *Where is the talent? Do males or females dominate the top of a field?* These are the conspicuous achievers who create cultural images of success. Among the top students in a subject area, a different picture emerges.

Among students at the top of the heap, gender differences in achievement test scores can be large and consequential even when only slight differences exist in the general population. In the top 10 percent of high school students, females surpass males in writing ability and reading achievement while males surpass females in mathematics, geopolitics, and science performance.

Using the same database combining the achievement test scores of 12th grade students, Willingham et al. (1997, pp. 80-83) examined the sex distribution among the top 10 percent of the students. The top 10 percent in a high school class is not a very select group, not the group that is apt to achieve national prominence in an area. Still, we can see the outlines of a gender problem emerging. In this top group, even in high school, males dominate the top group in science (7 out of 10); mathematics (almost 6 out of 10); history and civics (6 out of 10). Females dominate the top group in writing (7 out of 10) and in reading (6 out of 10). In other **select groups,** such as students who take the Scholastic Aptitude Test and the mathematics and science Advanced Placement Tests, men also score substantially higher than women, especially in areas like physics (Bae & Smith, 1997).

In short, differences in the performance of males and females in the general population are small, even in science and mathematics. But more males end up at the top in science and mathematics, among the most conspicuous achievers. Why?

One important reason has less to do with bias than with biology—the greater variability of males on many human characteristics.[5] Most of us have in our minds an image of the bell-shaped curve that comes from IQ tests—a voluptuous bell curve with a generous middle and spreading extremes. We do not stop to consider that bell-shaped curves can take other forms. A bell-shaped curve with exactly the same average, for example, can be high and peaked. The bell-shaped curve in a male population tends to take the voluptuous shape with more males at the extremes; the bell-shaped curve in a female population tends to be high and narrow with fewer females at the extremes. The illustration below shows two such bell-shaped curves, exaggerated to make the point that two populations with the exactly the same averages can nonetheless have very different numbers of people at the extremes.

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[5] Greater male variability could result from cultural influences as well as biological influences. But the greater number of males appearing at the bottom of the barrel in intellectual functioning suggests that a flatter, more spread out normal curve among males is in no small part a result of biology.

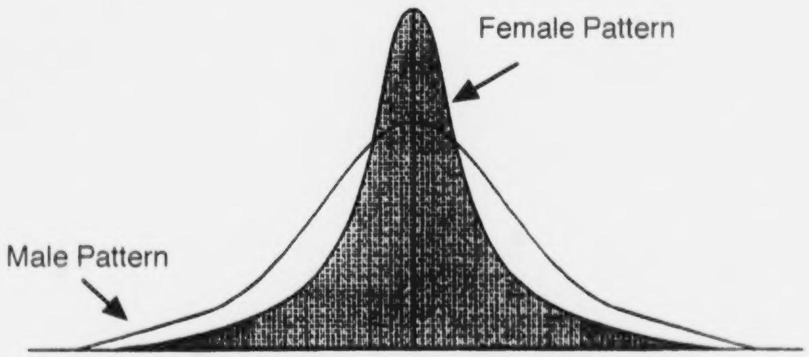

Illustration: Same Average, Different Variability

On many characteristics, the bell-shaped curve among males takes the voluptuous form: More males appear among the top talent and more males appear at the bottom of the barrel. As a consequence, males more often end up in the ranks of conspicuous achievers. As Willingham & Cole (1997) point out:

> Greater male variability tends to work to the advantage of males at the top of the score distribution....More variable male scores **exaggerate** [emphasis added] any male advantage at the top....If male scores are more variable, there is less female advantage at the top than would ordinarily result from a higher female mean. (p. 51)

In short, greater variability among males means that more academic stars, those at the extreme right end of the normal curve, are apt to be males. But this variability also means that more males will be at the extreme left of the normal curve, academic duds. This is exactly what happens.

Gender Differences in Special Education and Learning Disabilities

Males More Often Appear At the Bottom of the Barrel in Schools, Labeled as Impaired and Assigned to Special Education Classes

The over-representation of males in special education classes and in virtually every other category of emotional, behavioral, or neurological impairment is undisputed. In reviewing cognitive tests that typically show sex differences, Halpern (1997) summarizes this research:[6]

> Males are overrepresented at the low-ability end of many distributions, including the following examples: mental retardation (some types), majority of attention deficit disorders, delayed speech, dyslexia (even allowing for possible referral bias), stuttering, and learning disabilities and emotionally [*sic]* disturbances. (p. 1102)

Far more boys than girls end up in special education programs. Even the AAUW report (1992, p. 19) underscores this point, "Boys outnumber girls in special education programs by startling percentages." Overall, twice as many boys as girls end up in special classes for the impaired (Table 5).

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[6] See Halpern (1997) for the citations supporting these conclusions. She points out that her citations are illustrative and the literature is too voluminous for complete reference lists.

Table 5: More than Double the Number of Males Are Enrolled in Special Education Programs: Ratio of Males to Females

Type of Disability	1986	1988	1990	1992
Learning Disability	2:1	2:1	2:1	2:1
Mental Retardation	1:1	1:1	1:1	1:1
Emotional Disturbance	3:1	5:1	3:1	4:1
All Disabilities	2:1	2:1	2:1	2:1

Source: Adapted from*The Condition of Education 1997,* (Table 46-2), National Center for Education Statistics, 1997, Washington, DC: U.S. Department of Education.

The AAUW report attributes this discrepancy to school bias: teachers discriminate against badly behaved boys. Mislabeling boys may indeed be part of the explanation. But many of these disabilities appear long before boys even enter school. Reviewing research on sex difference in learning disabilities (Nass, 1993) reports large differences in male-female ratios across many disorders, including such disorders as autism, which appear early in life (Table 6).

Table 6: Males Vastly Outnumber Females on Many Measures of School-Related Disabilities

Type of Disability	Ratio of Males to Females
Dyslexia	4:1
Autism	4:1
Stuttering	4:1
Language Disorders	3:1

Source: Adapted from "Sex Differences in Learning Abilities and Disabilities," by R.D. Nass, 1993, *Annals of Dsylexia*, 43, p. 62.

Greater male vulnerability to disorders is evident before or at the time of birth. Obstetrical complications such as toxemia are more common with male fetuses (1.7:1) as is abruptio (2:1), spontaneous abortion (1.4:1), and birth trauma (1.8:1), as Nass (1993, p. 62) points out. Males are more apt to display virtually every neuro-developmental and psychiatric disorder of childhood (Gualtieri & Hicks, 1985).

This is the basic point: The greater number of males at the top in fields like mathematics and science does not necessarily mean that the schools are shortchanging girls. The greater number of males at the bottom in classes for children with learning disabilities does not necessarily mean that the schools are shortchanging boys. Males are more variable on many physical and neurological dimensions.

Consider the largest and most stable sex difference in cognitive abilities—the male advantage in spatial-rotational skills. This ability, important in advanced mathematical reasoning, has a biological foundation. Spatial-rotational skills are linked to higher testosterone levels. Halpern (1997) reviews a variety of evidence:

> The spatial-skills performance of normal males fluctuates in concert with daily variations in testosterone and seasonal variations...When normal, aging men were given testosterone to enhance sexual functioning, they also showed improved performance on visual-spatial tests...
>
> Additionally, when female-to-male transsexuals were given high doses of testosterone in preparation for sex-change therapy, their visual spatial skills improved dramatically and their verbal fluency skills declined dramatically within three months. The results of these studies and others provide a strong causal link between levels of adult hormones and sex-typical patterns of cognitive performance. (p. 1095)[7]

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[7] References to these specific studies may be found in Halpern (1997).

To point out the strong evidence linking spatial skills to testosterone levels does not mean that cultural influences do not also affect cognitive performance. As Halpern (1997) also points out:

> Females scored more poorly on a math test when they were told that the test produced gender differences than when the test was described as being insensitive to gender differences. The participants were not conscious of the effect of these instructions on their performance, but activating their knowledge of negative stereotypes prior to the tests had a substantial negative effect. (p. 1096)

Adding additional complexity to the tangle of biological and cultural influences on intellectual functioning is recent research suggesting that the activities in which people engage influences the way their brains develop (Reviewed in Halpern, 1997). If little boys play with building blocks while little girls enact dramatic fantasies in the doll corner, these activities will strengthen the neural circuitry involved in spatial skills or verbal skills.

In sum, the research literature on sex differences in scores on cognitive tests and the origins of these differences is complex and contentious. But there is general agreement on a few important points. First, in the general population most sex differences on standardized tests of achievement are small or negligible. Second, among select groups of higher-achieving young people, however, females have an advantage in reading achievement and writing skills while males have an advantage in mathematics, science, and geopolitics. Third, males are more variable than females in many characteristics, such as mathematics achievement. Males are far more apt to show up at the bottom of the heap, over-represented in special education classes. By the same token, males are more apt to show up at the top of the heap, over-represented among the star mathematics students. Finally, sex differences in intellectual achievement are rooted in both biological and in cultural influences which have circular and mutually reinforcing effects. Schools are not necessarily "shortchanging" either girls or boys when sex differences occur in cognitive tests and achievement tests.

Even though the schools may not be the cause of sex differences in achievement, the schools still have an important role to play in making sure that both girls and boys have the opportunities to develop their intellectual skills. But they need to be attentive to common problems of boys, not only of girls. Teachers, for example, should make sure that boys in the early grades, who may lag behind in reading skills, are not stigmatized as "slow learners" and assigned to classes where they receive lower quality instruction. Teachers need to guard against labeling rowdy or disobedient boys as suffering from "attention deficit disorder" or "emotional disabilities." Teachers also need to encourage girls to take mathematics and science courses and to create classroom cultures where girls actively participate.

Improvements in mathematics and science education for females have taken place. Government agencies, private foundations, and universities have supported a spate of gender equity programs, special summer and internship programs, and teacher training efforts to encourage young women to move forward in science and mathematics. These efforts have borne fruit. Comparable programs have not targeted the areas where boys are behind.

Females Now Take as Many High School Classes in Mathematics and Science as Males Do. In Advanced Placement Classes in Mathematics and Science, the Gender Gap is Narrowing.

For women to have opportunities for high level achievement in science and mathematics, they need to take demanding courses in high school. If they do not, they will find themselves out of the pool of potential talent. In the 1980s, high school girls were far less likely than boys to take science and mathematics classes (Bae & Smith, 1997). By 1994, this gap had closed (Table 7). Female high school students now take as many mathematics and science classes as males do—partly as a result of a nationwide trend to strengthen academic requirements in high schools. Physics is the exception. The gender gap in favor of males in physics courses, however, is not as large as the gender gap in favor of females in chemistry courses.

Table 7: Females Have Caught Up with or Surpassed Males in High School Mathematics and Science Courses: High School Graduates, 1994

High School Courses	Males	Females
Algebra I	65%	68%
Geometry	68%	72%
Algebra II	55%	62%
Trigonometry	17%	17%
Analysis/pre-calculus	16%	18%
Calculus	9%	9%
Biology	92%	95%
Chemistry	53%	59%
Physics	27%	22%

Source: Adapted from *Gender Equity Right From the Start* (p. 12), by J. Sanders, J. Koch, and J. Urso, 1997, Mahwah, NJ: Lawrence Erlbaum; and based on *The Condition of Education 1996* (p. 100), by National Center for Education Statistics, 1996, Washington, DC: U.S. Department of Education.

Increasing number of females are also enrolling in Advanced Placement (AP) courses in mathematics and science, essentially taking college level work while still in high school. A greater proportion of females take AP examinations than males (Willingham et al., 1997, pp. 118-121). Females are over-represented in AP English and languages tests while males are over-represented in AP tests in mathematics and the natural sciences. But the proportion of women taking AP examinations in mathematics and the natural sciences has increased from 37% in 1982-1983 to 43% in 1992-1993.

Yet males who take AP tests in mathematics and science still do better than females. In 1995, for example, the number of students who qualified for college credit (scores of 3 or higher) in calculus, for example, was 12 per 1000 for males and 9 per 1000 for females (Bae & Smith, 1997, p. 16). In sum, more females are taking AP mathematics and science tests and the proportion making high scores has stayed the same. The result is to increase the total number of talented, high achieving women in mathematics and science.

In short, the gender gap favoring males in mathematics and science is very small in the general population but pronounced among the highest achievers. This gender gap continues into higher education. But it is only one part of a larger story.

Gender Differences at the Postsecondary Level

In college attainment, a gender gap exists and is increasing. But this gender gap clearly favors females.

Women Have Become the Majority of College Students—Especially in the African-American Population—and Women Earn the Majority of Bachelor's and Master's Degrees

Far from the schools shortchanging girls, colleges are serving a disproportionate number of female students. In some liberal-arts colleges, the gender imbalance has become such a serious matter that administrators have quietly developed male "affirmative action" programs for males, who are admitted with lower grades and test scores (Gose, 1997). A gender imbalance in favor of females has begun to show up at large public universities. In the fall of 1991, for example, 55 percent of the students in the entering class were women (Gose, 1997).

Some professors warn that young men at certain colleges are developing a culture adversarial to academic striving, differentiating themselves from college women who pursue academic success with a clear focus (Kleinfeld, 1997).

Furthermore, males from economically disadvantaged groups—African-Americans, Hispanics, and American Indians—are lagging far behind female counterparts. This gender imbalance has disturbing implications. Going to college influences people's values and world-view. A large educational gap between men and women increases the difficulty of finding compatible mates and forming stable families.

Table 8: More Women Than Men Are Enrolling in College—Especially Women From Economically Disadvantaged Groups: Proportion of Women Enrolled in College

Racial and Ethnic Group	1976	1990	1995
White	47%	56%	55%
African-American	55%	61%	62%
Hispanic	45%	55%	56%
American Indian	51%	58%	58%
Asian	45%	48%	49%
All	47%	55%	56%

Source: From*Chronicle of Higher Education Almanac Issue,* (p. 18), 1997.

More women than men are also graduating from college and going on to get master's degrees (*Chronicle of Higher Education Almanac Issue,* 1997, p. 22). In 1995, for example, women won 55 percent of the bachelor's degrees and 55 percent of the master's degrees. Among African-Americans, the gender gap in favor of females is far larger. In 1995, African-American men won only 36 percent of bachelor's degrees and only 34 percent of master's degrees. The shortchanged group is not female—it is African-American males.

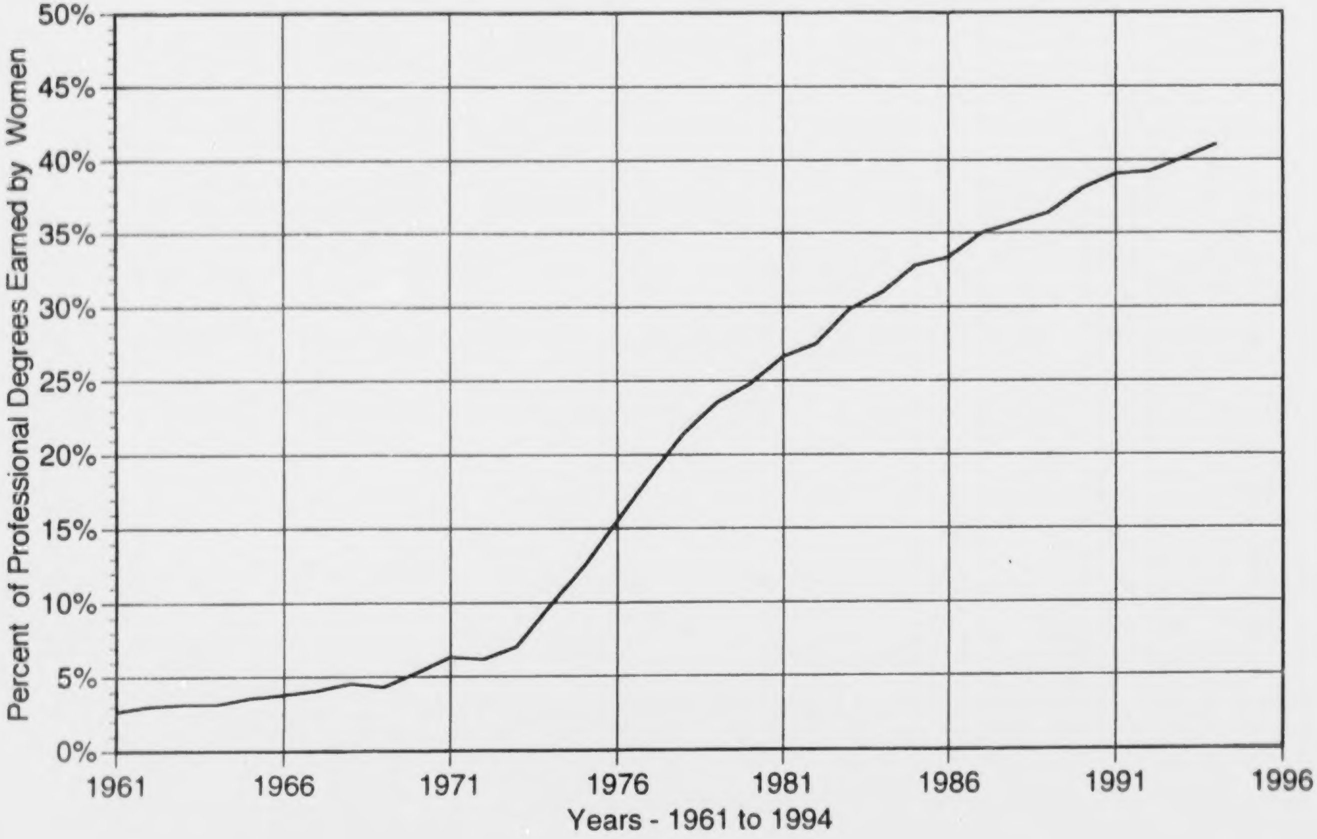
Women Are Closing the Gender Gap in Professional Degrees and in Doctoral Degrees

Professional Degrees. Since the 1960s, women have made stunning progress in obtaining advanced degrees. Their progress is especially evident in professional fields—the major focus of women's career ambitions.

* Women attained over 40% of professional degrees awarded in 1994, up from almost none in 1961 (Figure 1).

* Minority women made especially large gains in attaining professional degrees. African-American women received 57% of professional degrees awarded to African-Americans in 1994, outdoing African-American men (Table 9).

Figure 1
Women In 1994 Attained Almost Half of Professional Degrees, Up from Almost None In 1961



Professional degrees include law, medicine, theology, dentistry, chiropractic medicine, veterinary medicine, pharmacy, osteopathic medicine, optometry, and podiatry.

Source: National Center for Education Statistics, *Digest of Education Statistics 1996*, Table 239

Table 9: Women Have Made Enormous Strides in Professional Degrees and African-American Women Are Outstripping African-American Men: Proportion of Professional Degrees Awarded to Female

Ethnic Group	1977	1985	1990	1994
White	18%	33%	37%	39%
African-American	31%	46%	51%	57%
Hispanic	17%	34%	40%	43%
American Indian	19%	29%	47%	40%
Asian	24%	37%	42%	45%
Total	19%	33%	38%	41%

Source: From *Digest of Education Statistics 1996* (Table 268), by National Center for Education Statistics, 1996, Washington, DC: U.S. Department of Education.

Note: Professional degrees include law, medicine, theology, dentistry, chiropractic medicine, veterinary medicine, pharmacy, osteopathic medicine, optometry, and podiatry

Women are not only catching up, but actually surpassing men in some professional fields.

* Most women with professional aspirations seek law degrees. In 1994, 43 percent of law degrees were awarded to women.

* Most women with professional aspirations seek law degrees. In 1994, 43 percent of law degrees were awarded to women.

* In 1994, women received the majority of professional degrees awarded in veterinary medicine, pharmacy, and optometry.

Table 10: Women Received the Majority of Degrees in Veterinary Medicine, Pharmacy, and Optometry in 1994

Professional Degree	Men	Women	Proportion Women	5-Year Change
Chiropractic	2,094	874	29%	+15%
Dentistry	2,480	1,417	36%	-5%
Law	22,592	16,757	43%	+8%
Medicine	9,507	6,030	39%	+3%
Optometry	538	647	55%	+11%
Osteopath	1,249	605	33%	+19%
Pharmacy	785	1,479	65%	+89%
Podiatry	370	175	32%	-19%
Theology	4,443	1,535	26%	+2%
Veterinary	762	1,386	65%	0%

Source: From *Chronicle of Higher Education Almanac Issue* (p. 23), 1997.

Business Administration Degrees. Women are also catching up in receiving business degrees, especially the advanced MBA.

* In 1995, American women received over 37 percent of the MBAs awarded American citizens (NCES, 1997b, Table 269).

* The number of MBAs awarded to women since 1965 has increased more than a hundredfold. In 1965, women received only about 300 MBAs. In 1995, women received almost 35,000 MBAs (NCES, 1997b, Table 281).

Doctoral Degrees. The gender gap in doctoral degrees is also closing. Since the 1960s, women have made enormous progress in gaining doctoral degrees (Figure 2).

* In the biological and life sciences, American women in 1994 received over 40 percent of the doctorates, up from 12 percent in 1962 (Figure 3). [8]

* In mathematics and the physical sciences, American women in 1994 received over 20 percent of the doctorates, up from only 4 percent in 1961 (Figure 4). [9]

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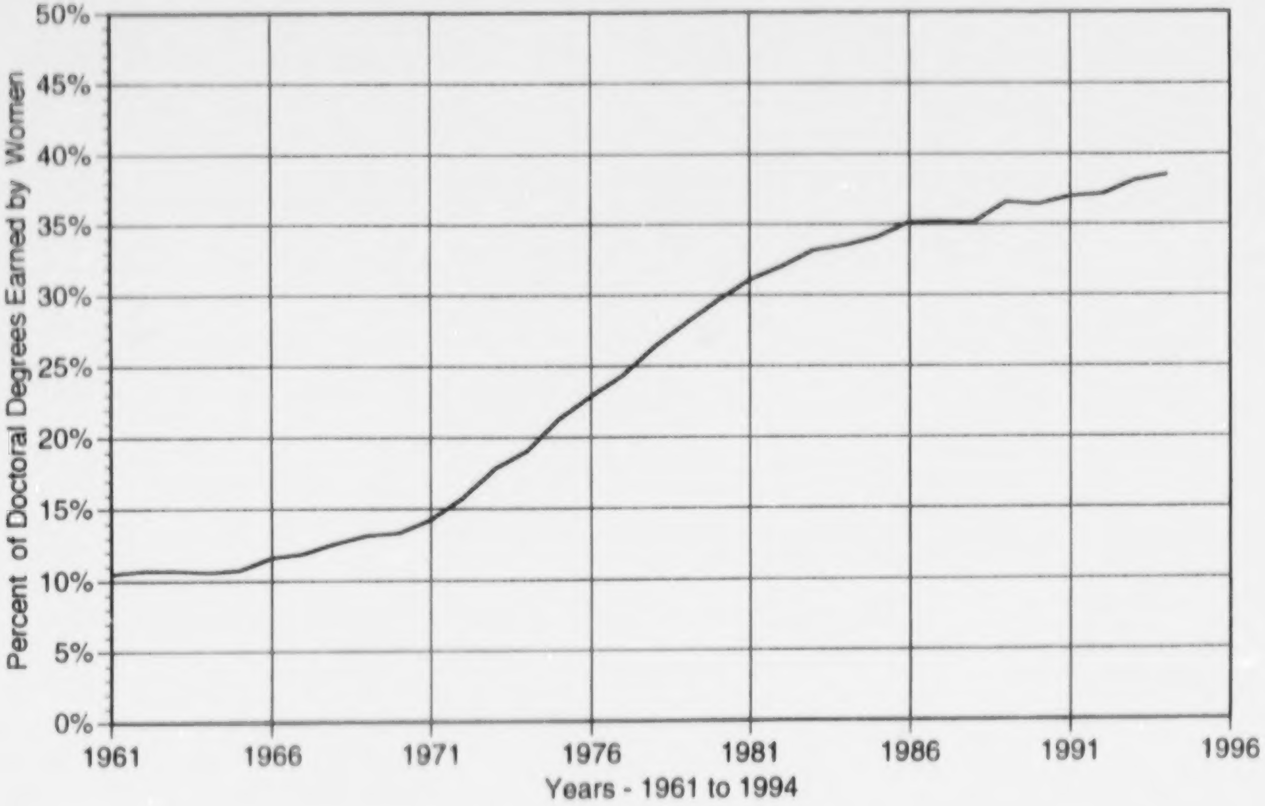
[8] Figure 3 does not take into account the large numbers of international students who receive doctorates in the life sciences because the *Digest of Education Statistics 1996* does not provide the information for early years.

[9] Figure 4 does not take into account the large numbers of international students who receive doctorates in the physical sciences and mathematics because the *Digest of Education Statistics 1996* does not provide the information for early years.

Figure 2

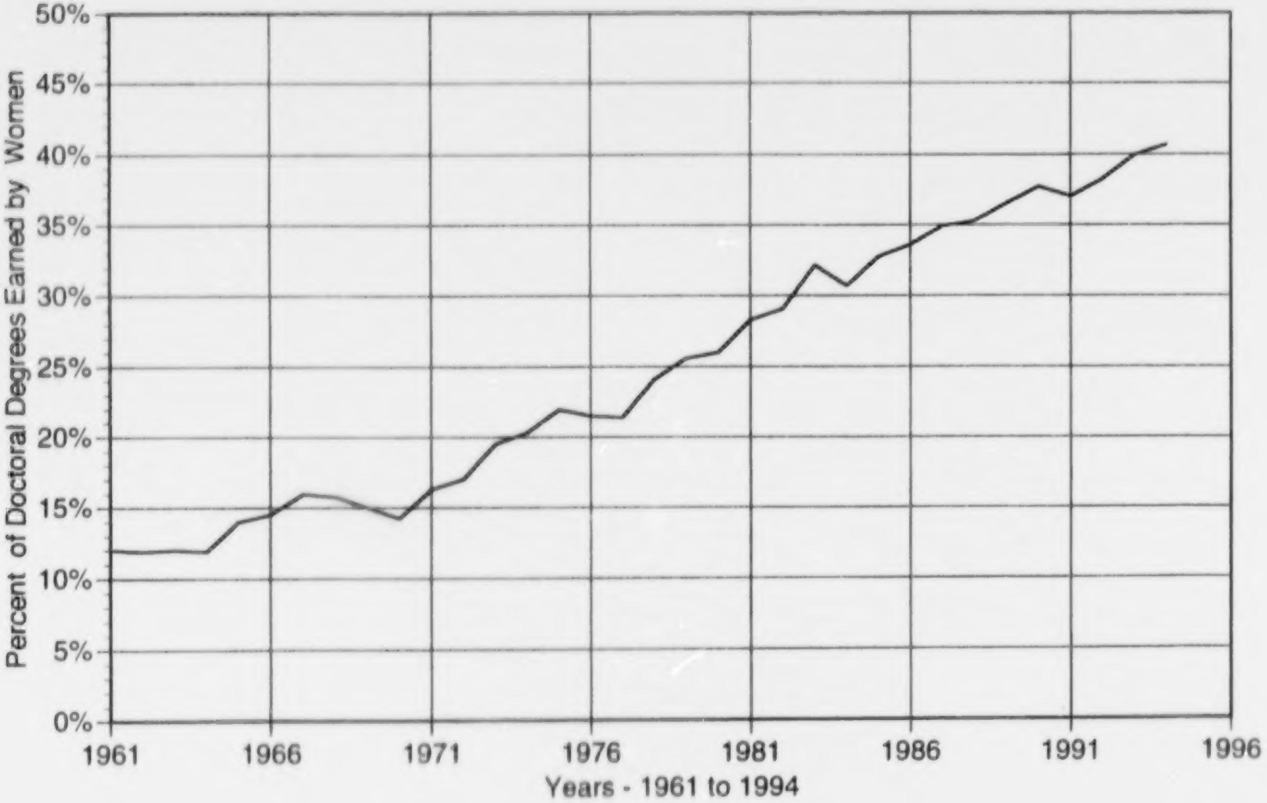
Women In 1994 Attained About 40 Percent of Doctoral Degrees, Up from About 10 Percent In 1961



Source: National Center for Education Statistics, *Digest of Education Statistics 1996* Table 239

Figure 3

Women In 1994 Attained Over 40 Percent of Biological and Life Sciences Doctoral Degrees, Up from 12 Percent In 1962

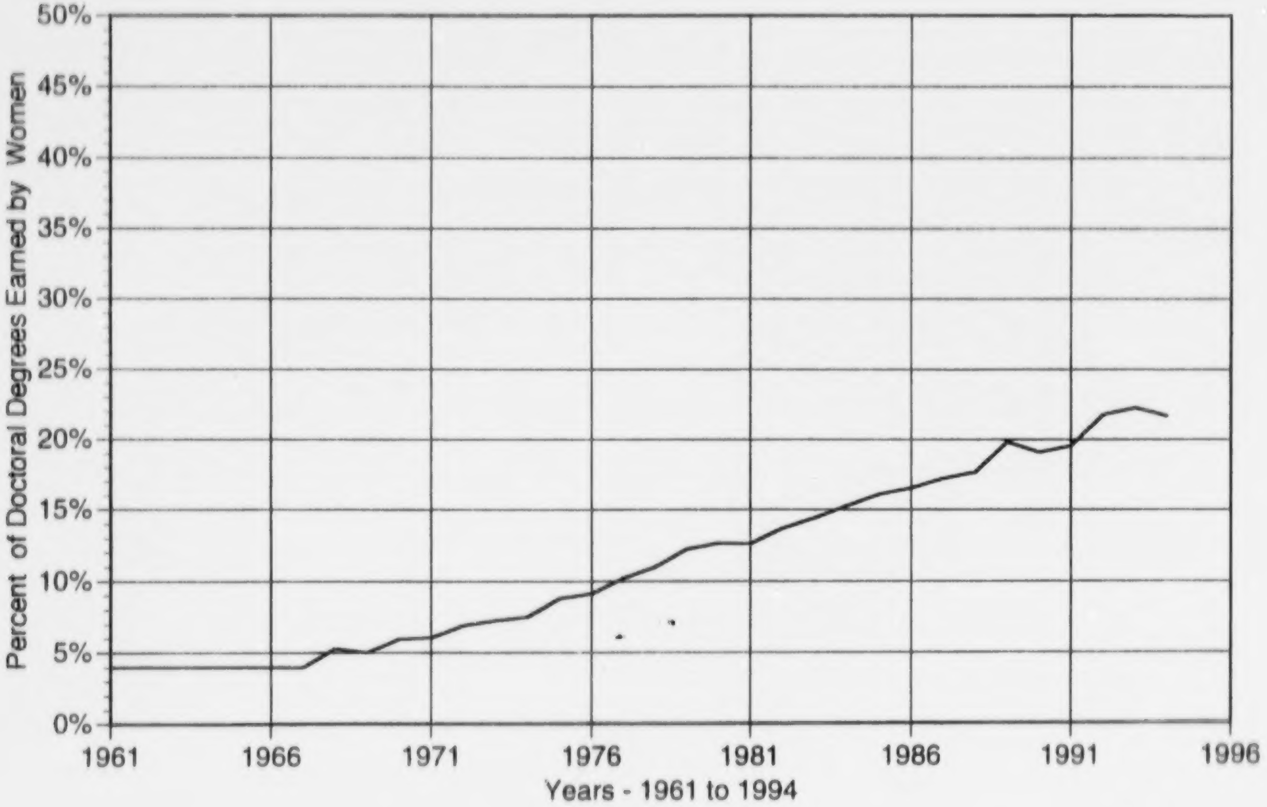


Degrees include biology, biochemistry, biophysics, botany, cell and molecular biology, microbiology, bacteriology, zoology, and other biological sciences.

Source: National Center for Education Statistics, *Digest of Education Statistics 1996* Table 273 (data interpolated for 1961, 1963, 1965, 1969).

Figure 4

Women In 1994 Attained Over 20 Percent of Mathematics and Physical Sciences Doctoral Degrees, Up from 4 Percent In 1961



Degrees include statistics, astronomy, astrophysics, atmospheric science and meteorology, chemistry, geology, physics, science technology, and other physical sciences.

Source: National Center for Education Statistics, *Digest of Education Statistics 1996* Tables 285 and 286 (data interpolated for 1961-1967 and 1969).

Since the early 1960s, women have received more than three times as many doctorates in the biological sciences and more than five times as many doctorates in the physical sciences and mathematics.

American women are actually making far more progress in the biological sciences and in mathematics and the physical sciences than these historical analyses reveal.[10] The reason is the increasing number of students from other countries, overwhelmingly male, who now receive doctorates from American universities. In 1995, more than a third of the doctorates awarded went to international students, and males in this group outnumbered females by a ratio of considerably more than 3 to 1 (*Chronicle of Higher Education Almanac Issue,* 1997, pp. 22-23).

If we consider only doctorates awarded to American citizens and resident aliens, we see that the gender gap has almost closed. In 1995, American women received 45 percent of the doctoral degrees awarded to American citizens (Table 11). Among African-Americans, American-Indians, and Hispanics, women received half or more of the doctorates.

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[10] The historical figures on the growth of doctorates awarded to women have not been corrected for the influx of students from other country, mostly male, because I could not locate historical data on foreign students for the 1960s and early 1970s. The historical figures, thus, underestimate the numbers of women receiving doctorates.

Table 11: American Women Are Obtaining Almost Half of Doctorates Awarded to American Citizens and African-American Women are Surpassing African-American Men: Proportion of Doctorates 1994-95

Ethnic Group	Males	Females
African-Americans	44% (n =731)	56% (n =936)
American Indians	45% (n = 58)	55% (n =72)
Hispanics	50% (n = 488)	50% (n= 496)
Asians	65% (n =1,758)	35% (n =932)
Whites	55% (n = 15,354)	45% (n = 12,472)
Total	55% (n = 18,407)	45% (n = 14,909)

Source: From *Chronicle of Higher Education Almanac Issue* (p. [illegible]), 1997.

Students from other countries, furthermore, are concentrated in mathematics and the physical sciences. If we omit these international students, the progress of American women in the sciences becomes even more substantial. In 1995, American women received 43% of doctorates in the biological sciences, 24% of doctorates in mathematics and 22% of doctorates in the physical sciences (Table 12).

Table 12: Women Are Closing the Doctorate Gap in Many Fields: Doctorates Awarded in 1993-94, U.S. Citizens

Major Field of Study	Men	Women	Proportion Women
Biology	1884	1404	43%
Computer Science	365	82	18%
Education	2413	3898	62%
Engineering	2382	404	15%
English	479	700	59%
Health	548	930	63%
Mathematics	450	146	24%
Physical Sciences	2335	659	22%
Psychology	1270	2127	63%
Social Sciences	1561	1095	41%

Source: From *Digest of Education Statistics 1996* (Table 266), by National Center for Education Statistics, 1996, Washington, DC: U.S. Department of Education.

The drumbeat in the media concerning the low numbers of women in science and mathematics diverts policy attention from another gap we should be worried about—the deteriorating performance of American students compared to international students in the advanced sciences and mathematics. In 1994, students from the United States earned only 53 percent of the doctorates in mathematics and the physical sciences awarded by American universities (NCES, 1996, Table 293).

The gap in performance between American men and women in the natural sciences and in mathematics is genuine and indeed a cause for concern. But this gender gap, it is also important to recognize, affects the prospects and careers of very few people. It is far from a monumental social problem. In 1994, for example, 450 American men received doctorates in mathematics compared to 146 women. In the physical sciences, 2,335 American men received doctorates compared to 659 women (NCES, 1996, Table 266). To achieve parity in mathematics and the physical sciences would affect fewer than 2,000 women a year. Consider the number of people affected by a different gender gap, which is virtually ignored—the gap in the college graduation rates of African-American men, who are far behind African-American women. To close this gender gap would advance the prospects of twelve times as many people—close to 24,000 African-American men each year (*Chronicle of Higher Education Almanac Issue*, 1997, p. 23).

In short, women are moving into high status occupations in enormous numbers. Ambitious women, however, are seeking professional degrees far more often than doctoral degrees in mathematics and the physical sciences (Bae & Smith, 1997, p. 18). Among women who were college freshmen in 1996, twice as many women (20 percent) aspired to professional fields compared to men (less than 10 percent). More men did seek careers in the physical sciences and mathematics (3 percent) compared to women (2 percent), but these numbers are minuscule.[11] The emphasis on the gender gap in mathematics and science has diverted attention from the great strides large numbers of women are making in the high status careers they are choosing—the professions.

Gender Differences in Classroom Participation

If girls make higher grades in school, get higher class rank and more academic honors, surpass boys on standardized tests in two subjects (reading and writing) and lag behind in two subjects (mathematics and science), graduate from college more often but attain a slightly smaller proportion of advanced degrees, what then is the basis for the charge that the schools shortchange girls? A fair judge might call such a pattern a draw: females do better in some academic areas and males do better in others.

The charge that the schools shortchange girls is not based on such hard and comprehensive measures of educational attainment but instead on soft and slippery issues, like the "silencing" of girls in the classroom. The

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[11] The other large gap between men and women occurs in engineering, the target of 15 percent of men who were college freshmen compared to 3 percent of women (Higher Education Research Institute, 1996 cited in Bae & Smith, 1997). Engineering, a less glamorous field, does not receive much attention in the debate on women's progress.

AAUW report (1992) emphasizes dramatic, highly publicized findings from research by David and Myra Sadker:

> Whether one looks at preschool classrooms or university lecture halls, at female teachers or male teachers, research spanning the past twenty years consistently reveals that males receive more teacher attention than do females...
>
> Researchers David and Myra Sadker have studied these patterns for many years. They report that boys in one study of elementary and middle school students called out answers eight times more often than girls did. When boys called out, the typical teacher reaction was to listen to the comment. When girls called out, they were usually corrected with comments such as, "Please raise your hand if you want to speak." (p. 68)

The Sadkers' findings are indeed shocking. The problem is that the research on which these dramatic findings were based has strangely disappeared (Sommers, 1994; Kleinfeld, 1996). It is hard for a study to disappear—ordinarily many copies are made and circulated. I telephoned David Sadker to ask him directly about the serious charge that his famous study had disappeared. He could not send me a copy of the report. He disingenuously directed me to his university's proposal office and asserted that many other studies of classroom interaction support the contention anyway that boys receive far more attention than girls in the classroom.

Leaving the Sadkers' "lost" study aside, what evidence do we have from other studies of classrooms that teachers do give more attention to boys or even that boys talk more in the classroom? This seems like a straightforward question, but the question actually contains a tangle of murky issues. First, the question carries a hidden assumption—that differences in teacher attention actually influence how much students learn. But we actually have no evidence that talking in class or getting attention from the teacher makes any difference to student achievement, as Lindow, Marrett, & Wilkinson (1985, pp. 13-14) point out in their summary of the major studies on classroom interaction.

Second, the meaning of "getting attention from the teacher" is unclear. Suppose, for example, that a teacher asks a fourth-grade boy a question in class. Is this a genuine academic question, which will help him learn? Or is the teacher's question actually a reprimand in disguise? The teacher may see that the boy is acting up and use the question to get him back on task.

Third, studies of classroom interaction are expensive and difficult to conduct, so we do not have large, representative studies of what goes on in different classrooms, in different subjects, and in different locales. To get a stable and reliable measure, a well-trained researcher must sit in the classroom for many hours and count who talks, who asks questions, who answers questions. Unlike achievement tests or college graduation rates, we have no nationally representative data on the question.

Finally, most classroom interaction studies, especially in recent years, have been conducted in classrooms where females are suspected to be, and most likely are, at a disadvantage. These are high school mathematics and science classrooms, subjects where females generally do not excel, and law school classrooms, where an aggressive style of classroom questioning has long been considered crucial to preparing students for the combat of legal discourse (Reviewed in Young, forthcoming). The research on gender interaction in the classroom does not feature studies conducted in literature classes or foreign language classes, areas of female strength. In these classrooms, the results might be quite different.

Sex differences in classroom participation, as measured by observers, are small, inconsistent, and variable. Some results show teachers favoring boys while others show teachers favoring girls.

The classic *Gender Influences in Classroom Interaction* presents the studies of the leading researchers who have examined patterns of classroom talk. In their "Overview" to the studies in this book, Janet Lindow, Cora Marrett, and Louise Cherry Wilkinson (1985) provide a clear description of the typical classroom patterns researchers have found:

> Research conducted in elementary school classrooms shows rather consistently that teachers give more attention to boys than to girls (Berk & Lewis, 1977; Blumenfeld, Hamilton, & Bossert, 1979; Minuchin & Schapiro, 1983, p. 228), although there is also research to the contrary (cf. Field, 1980). However, much of the contact with boys tends to be negative; it is managerial and disciplinary in nature (Bossert, 1981; Huston, 1983, p. 439; Leinhardt, Seewald, & Engel, 1979).
>
> There is less consensus regarding teacher instructional contacts. Although several studies found that girls receive more instructional contacts (Biber, Miller & Dwyer, 1972; Fagot, 1973; Fagot & Patterson, 1969) others found the opposite (cf. Sears & Feldman, 1966). (p. 5)

In a nutshell, no consistent pattern of male or female favoritism appears. Teachers do give more attention to boys but this attention has to do with keeping boys in line. Whether teachers give more academic attention to boys, the kind that might indicate bias, is unclear. Sommers' (1994) more recent literature review highlights the same inconsistency:

> A 1987 study by K. Tobin and P. Garnett had found that a few "target" students in the science classroom tended to dominate classroom interactions, and these targets tended to be males. But a further study of target students...found that "although there were more male than female target students, the female target students averaged more interactions per class session than male target students."
>
> That kind of result is typical of the status of research in this area. It makes one wonder whether the study of student-teacher interaction ,using gender as a key category and "unconscious bias" as a possible parameter, is worth all the trouble. (p. 167)

Law schools are the most recent front in the battle over which sex dominates the classroom (American Bar Association, 1996). Reviewing this field of combat, Young (forthcoming) concludes that the following charge could be correct: Men may indeed talk more than women in some law school classes. On the other hand, verbal combat in the classroom socializes law students for verbal combat in the courtroom.

Not all students preparing to be lawyers, whether men or women, may find the intellectual thrust and parry of the Socratic method a congenial form of discourse. If their law school classes did **not** prepare them for such verbal combat, important both in the courtroom and in negotiations, then the schools would indeed be shortchanging the many women preparing to be lawyers.

As any experienced teacher knows, who talks in class and who gets more attention from the teacher depends a great deal on the particular situation—the personalities of the students in this particular class, the subject matter, the classroom rules, the preferences of the teacher for orderly turn-taking versus fast-paced classroom discussion. The AAUW's charge that girls are silenced in the classroom ignores the complexity of classroom life.

The AAUW's own commissioned research in fact undercuts the position it trumpets—that girls receive less attention than boys. The AAUW sponsored a nationwide survey of 3,000 children between grades four and ten which forms one important statistical base for its glossy, highly publicized reports (American Association of University Women [AAUW]/Greenberg-Lake, 1990). When I tried to obtain a copy of this report, I had a difficult time.

While the politicized version, *How Schools Shortchange Girls* (1992) is available for a mere $16.95, obtaining the full data report requires a payment of $85.00 for unbound xeroxed pages. The AAUW provides an 800-number for ordering its reports, but the person I called at this number knew nothing about the full data report. I then called the AAUW offices, left messages, and waited for weeks to get telephone calls returned until I finally located someone who knew of this report.[12]

That the AAUW should make the report difficult to obtain is understandable. The data from their own report do not back up the charges they publicize—that girls receive less attention from teachers. When asked about their personal experience, boys and girls reported receiving virtually identical amounts of attention from their teachers (Table 13). The gender differences that occur are trivial, and sometimes favor boys and sometimes favor girls.

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[12] Sommers (1994, pp. 141-142) reports a similar experience when she tried to get a copy of the full data report. What is shocking is that Sommers was asked to sign this statement before she could get the report: "Please send a statement outlining how you plan to use the survey instrument and results, along with your payment for the full research report. If your review and analysis of the data results in a possible publication or presentation, that use of data must receive advance written approval from AAUW." (p. 142). The report was old news when I requested the data report which may account for the reason Sommers had a different experience.

Table 13: Girls See Themselves Participating in Class as Much as Boys

Perceptions of Classroom Participation	Girls: Percentage "Yes"	Boys: Percentage "Yes"
Get Called on Often	59%	57%
Believe you know something but teacher doesn't think so	76%	74%
Have things to say but teacher doesn't let you	63%	67%
Answer questions a lot	50%	53%

Source: Adapted from *Expectations and Aspirations: Gender Roles and Self-Esteem* (pp. 15-16), by AAUW/Greenberg-Lake, 1990, Washington, DC: Greenberg-Lake.

When asked about teacher bias in teacher attention, boys and girls do report bias. But what they see is **bias against boys.** Boys and girls agree "by overwhelming margins," in the report's own words, that teachers give more attention to girls (AAUW/Greenberg-Lake, 1990, p. 64).

Table 14: Boys and Girls Believe Teachers Give More Attention to Girls

Beliefs About School Environment	**Boys' Perceptions**	**Girls' Perceptions**
Who does teacher call on more often?		
Boys	36%	35%
Girls	59%	57%
Who does teacher pay more attention to?		
Boys	29%	33%
Girls	64%	57%

Source: Adapted from *Expectations and Aspirations: Gender Roles and Self-Esteem* (p. 18), by AAUW/Greenberg-Lake, 1990, Washington, DC: Greenberg-Lake.

A more recent, nationally representative survey examining gender issues in public schools, *The Metropolitan Life Survey of The American Teacher 1997* (Harris, 1997), finds the same pattern. This study is based on a study of 1,306 students in grades 7-12 and a parallel study of 1,035 teachers from grades 6-12. When students are asked about their own participation in class, gender differences are small and inconsistent.

- Boys see themselves as participating in class more frequently than other groups, with 44%

participating "very often" compared to 38% females (Harris, 1997, p. 89).

* Girls who raise their hands see themselves as getting called on"often," by greater margins (72% vs. 66%) than boys (Harris, 1997, p. 98).

* More boys than girls (31% vs. 19%) feel that it is "mostly true" that teachers do not listen to what they have to say (Harris, 1997, p. 131).

* Boys demand more attention in class than girls, according to the majority (61%) of teachers and boys call out answers more according to about half (53%) of teachers (Harris, 1997, p. 122).

* On the other hand, 47 percent of teachers say that girls asked for more help after class (Harris, 1997, p. 108).

In sum, the research on classroom interaction does not show consistent teacher favoritism toward boys or girls. Whether we look at studies by observers sitting in the classrooms or the perceptions of the students themselves, what we see are small and inconsistent sex differences, some favoring girls and others favoring boys. We see no pattern of more academic attention going to boys, and, even if we did, we have no evidence that teacher attention in class has any relationship to achievement.

Gender Differences in Self-Esteem

The other highly publicized AAUW message—that girls have lower self-esteem than boys—rests on equally shaky grounds. The commercial success of psychologist Mary Pipher's (1994) pop-feminist book, *Reviving Ophelia: Saving the Selves of Adolescent Girls,* brought this message to the general public. A clinical psychologist who treats troubled girls, Pipher's anecdotes come primarily from her practice, not from any systematic, scientific comparisons of adolescent girls and adolescent boys. The message has been aired so often, on *Oprah* and the *Today* show, in *Time* and *Newsweek,* that its truth seems unquestionable. Everyone now knows, do they not, that girls have lower self-esteem than boys. Everyone now knows that girls suffer a severe drop in self-esteem at adolescence. Everyone now knows that boys gain confidence at adolescence while girls lose the vitality and confidence they displayed in childhood.

When I began the research for this paper, I as well did not question these beliefs. The issue, I thought then, was whether girls' loss of confidence and vitality at adolescence had anything to do with what happened to them in the school. Perhaps the explanation for adolescent girls' loss of self-confidence had to do with the hormonal changes of puberty; I consulted physicians on the physiology of puberty and the relationship of hormonal change to mood disorders. Perhaps the explanation for girls' loss of self-confidence had to do with the Barbie doll standards of thinness and beauty that so many adolescent girls struggle without success to attain; I wanted to take a hard look at what adolescent girls' sense of themselves was based on—beauty, popularity, academic success.

What I was not expecting to find was that the fundamental idea that I had simply taken for granted—that adolescent girls actually do have lower self-esteem than boys—might not be true. I did a computerized search of the recent research literature on self-esteem, with the assistance of a professional reference librarian. The database (PsychINFO) yielded 84 references to the combined keywords "human sex differences" and "self-esteem" and "adolescence." A review of this literature suggests these conclusions:

*** Self-esteem is extremely difficult to measure. Different studies define and assess self-worth, self-acceptance, self-confidence, and related concepts in quite different ways.**

*** The bases of self-esteem appear to be different in boys and girls and in different ethnic groups. What adolescents think about themselves is far more dependent on physical appearance and on relationships with friends than on what happens in schools.**

*** While boys are more often reported to have higher self-esteem than girls, the differences are typically small and could easily be explained by a slight tendency of boys to choose extreme response categories on vague, multiple-choice questions. Some of the most careful research in the field shows no differences between boys and girls either in "self-esteem" or in "loss of voice."**

Common sense suggests that a person's response to a question like whether "I'm happy the way I am" (a core question in the AAUW/Greenberg-Lake study) depends on the person's mood and recent experiences. Many people with a solid opinion of their own self-worth might not say "Always True" [emphasis in original] in response to such a statement because such an answer would reveal a most unbecoming lack of modesty or a most unbecoming disinterest in self-improvement. Yet, these are the types of questions on which the AAUW bases its findings about low self-esteem among adolescent girls.

Studies of adolescent self-esteem, moreover, reveal another problem which makes interpretation of these vague questions difficult. What adolescents say in response to such questions appears to be based on different criteria among females and males and among different ethnic groups (Thorne & Michaelieu, 1996; Tashakkori, 1993a; 1993b). Personal appearance and attractiveness and peer relationships play a large role in what adolescents think of themselves. This is the key point: *Academic self-confidence, the kind nurtured by the schools, does not show much* *relationship to general self-esteem in any gender or ethnic group* (Tashakkori, 1993a).

Leaving aside these serious problems in measuring self-esteem, the research actually shows no large, consistent gender differences in self-esteem at adolescence. Some of the most well-known researchers who specialize in the study of self-esteem, such as Susan Harter (1997), find no gender gap at all either in measures of self-esteem or in confidence in revealing your opinions and who you are (termed as "lack of voice" in Harter's research). Using carefully developed measures, Harter (1997) examined "lack of voice" among approximately 900 boys and girls from grades 6 through 12. Contrary to the feminist argument that "voice" declines for females as they enter adolescence, Harter (1997) finds:

> There is no evidence in our data for loss of voice among adolescent females as a group....The mean levels we obtain (average scores of around 3.0 on a four-point scale reveal that levels of voice are relatively high among young female adolescents. ...We have also found no evidence for gender differences favoring males... [Emphasis in original] (pp. 25-26)

Nor does Harter find that girls are more likely than boys to suppress their opinions in school because they don't want to seem smart and aggressive:

> It has also been claimed that girls, in particular, suppress their opinions within the school setting because they are fearful of looking too smart, which may cause them to risk rejection by their male classmates (Orenstein, 1994). We asked our low voice high school subjects to respond to items that tapped this issue directly (e.g., I don't say what I think because I don't want to look too smart). Once again, we found no gender difference supporting the claims that this is merely a problem for girls. Anecdotal reports from within the high school suggest that certain boys are fearful of being considered "nerds", "dorks", or "brains", if they are too smart, risking peer rejection. (pp. 38-39)

We need to pay attention to individuals, Harter emphasizes. Certain girls and certain boys do lack confidence and voice. But the problem is hardly limited to girls. "Reviving Ophelia," Harter (1997, p. 51) tartly concludes, "is certainly a worthy goal. However, Hamlet also displayed serious problems of indecision and lack of voice."

It is important to point out once again that the research literature on gender differences in self-esteem is full of inconsistencies. Some studies do show differences in global measures of self-esteem in favor of boys (Dukes & Martinez, 1994; Chubb, Fertman, & Ross, 1997; Francis & James, 1996). Careful analysis of such reports, however, raises the question as to whether such measures of self-esteem discriminate against girls who may not be as inclined as boys to brag or choose extreme responses on surveys.

The Commonwealth Fund Survey of the Health of Adolescent Girls, released in 1997, provides a recent example of the politicization of trivial sex differences in self-esteem (Schoen et al., 1997). The glossy report and media kit trumpet the standard, politicized message—a gender gap exists in self-confidence that widens in adolescence. I noted that the scoring system for the measure of self-confidence was most unusual—a lot of weight was placed on extreme responses in deciding who fell into the category of "high self-confidence." I telephoned the Commonwealth Fund to ask for a copy of the actual results for each question and, to their credit, the Commonwealth Fund promptly faxed to me the actual tabulations.

What this survey actually shows is remarkably similar levels of self-confidence among boys and girls. Boys are more apt to give extreme responses. This could indicate higher self-esteem but it could also indicate a lack of verbal subtlety or what some might consider an unfortunate lack of modesty. The following table presents the actual responses of boys and girls to these questions phrased in a straightforward, positive way:

Table 15: Adolescent Boys and Girls Both Express High Levels of Self-Esteem

Belief	Strongly Agree	Somewhat Agree	Total
I feel that I am a person of worth, at least on an equal basis with others.			
Girls	63%	27%	90%
Boys	67%	21%	89%
I feel that I have a number of good qualities.			
Girls	67%	26%	93%
Boys	70%	22%	92%
I am able to do things as well as most other people.			
Girls	52%	35%	87%
Boys	57%	30%	87%
I take a positive attitude toward myself.			
Girls	49%	35%	84%
Boys	59%	27%	86%
On the whole, I am satisfied with myself.			
Girls	46%	35%	81%
Boys	55%	29%	84%

Source: From *The Commonwealth Fund Survey of the Health of Adolescent Girls*, by C. Schoen, K. Davis, K. S. Collins, L. Greenberg, C. Des Roches, and M. Abrams, 1997, New York: The Commonwealth Fund. Data Tabulations provided by the Commonwealth Fund.

Virtually no important difference between adolescent boys and girls appears, and both sexes express virtually the same positive opinions of themselves when the "strongly agree" and "somewhat agree" categories are added together. Yet, these findings are sent to the media as more proof of the gender gap in self-confidence.

*** In terms of academic self-confidence, the type of self-esteem that depends on what happens in schools, teachers boost girls' academic self-confidence far more than they do that of boys.**

These are the basic findings about adolescent self-esteem promoted by the AAUW Report, *How Schools Shortchange Girls* (1992).

> A nationwide survey commissioned by the American Association of University Women in 1990 found that on average 69 percent of elementary school boys and 60 percent of elementary school girls reported that they were "happy the way I am"; among high school students, the percentages were 46 percent for boys and only 29 percent for girls. (AAUW, 1992, p. 12).

The AAUW report implies that the schools are to blame. Self-confidence is one more area where the schools shortchange girls. When I obtained the actual report on self-esteem on which this charge was based, I found no evidence that the schools eroded girls' self-confidence. The reason that so many teenage girls were not "happy with the way I am" at adolescence, as the actual AAUW/Greenberg-Lake report (1990) clearly shows, was that the girls are more dissatisfied with their physical appearance. As the report itself puts this point:

> **The Importance of Appearance.** For boys and girls of all races feelings of attractiveness are a fundamental part of overall self-worth. Evaluations of personal appearance (as measured by responses to the statement, "I like the way I look") correlate strongly with more general statements about self-esteem (such as "I'm happy as I am" and "I like most things about myself"). Other specific assessments of self-esteem, including academic performance, relationships with peers and family, feelings of importance and acceptance, are all less central to self-esteem than is appearance (p. 31).

The AAUW/Greenberg-Lake report (1990) does **not** show that the schools shortchange girls, that the schools in any way contribute to girls' dissatisfaction with themselves at adolescence. The report in fact shows the exact opposite. Girls see the school as an arena where they receive disproportionately **more** positive messages about themselves. Boys make the same judgment—teachers favor girls and boost their self-esteem.

These are the findings hidden in the statistical tables which the AAUW makes it so difficult to obtain:

Table 16: Teachers Bolster Girls' Self-Esteem in the Classroom Far More than Boys' Self Esteem

Perceptions of the School Environment	Boys' Answers	Girls' Answers
Who do teachers think are smarter?		
Girls	69%	81%
Boys	26%	13%
Who do teachers compliment more often?		
Girls	81%	89%
Boys	15%	7%
Who do teachers punish more often?		
Girls	8%	5%
Boys	90%	92%
Who do teachers like to be around?		
Girls	73%	80%
Boys	21%	12%

Source: Adapted from *Expectations and Aspirations: Gender Roles and Self-Esteem* (p. 18), by AAUW/Greenberg-Lake, 1990, Washington, DC: Greenberg-Lake.

Another AAUW report, released without publicity, also undercuts the message that the climate of the schools shortchanges girls (Lee, Chen, & Smerdon, 1996). This study is based an excellent sample, the National Educational Longitudinal Study of 1988, a carefully drawn sample of more than 9,000 students in almost 400 schools. Its authors explain that they had intended to examine school climate in the middle grades because of the "research identifying early adolescence as the developmental stage when a gender gap favoring boys often emerges in self-perception and school performance (AAUW, 1992)."

But the findings did not support this position at all. The study found only small to moderate gender differences, "favoring girls as well as boys" (Lee et al., 1996, p. 1). To the authors' chagrin, poor schools shortchanged boys far more than girls. The more orderly the school and the higher quality instruction, the more boys became engaged in learning and the larger the gender gap became, in favor of boys.

In a coup de grace to the AAUW's much publicized findings about the low self-esteem of adolescent girls, the 1997 Metropolitan Life Survey comes to the opposite conclusions. The Met-Life report on gender issues is one of a series of reports with the policy goal of bringing understanding to current issues that affect the nation's schools. As previously discussed, this survey sought the opinions of a nationally representative sample of 1,306 students from grades 7-12 and 1,035 teachers in grades 6-12 on girls' and boys' experiences in the schools and aspirations for the future. The conclusions flatly contradict the message that the schools shortchange girls:

> *** 1) contrary to the commonly held view that boys are at an advantage over girls in school, girls appear to have an advantage over boys in terms of their future plans, teachers' expectations, everyday experiences at school and interactions in the classroom;**
>
> *** 2) minority girls hold the most optimistic views of the future and are the group most likely to focus on education goals;**
>
> *** 3) minority boys are the most likely to feel discouraged about the future and the least interested in getting a good education; and**
>
> *** 4) teachers nationwide view girls as higher achievers and more likely to succeed than boys.**
> (Emphasis in original, p. 3)

The Met-Life study is based on teachers' and students' beliefs, not objective measures of actual school achievement. But the wealth of evidence reviewed in this paper shows that objective measures of achievement support these beliefs. Girls surpass boys in reading and writing skills. Girls are more apt to go to college and graduate with baccalaureate and masters' degrees. Girls have higher aspirations for professional degrees and have made dramatic progress in attaining both professional and doctoral degrees. Far from shortchanging girls, the schools encourage and favor girls.

Conclusion

The charge that the schools shortchange girls is false political propaganda. In their zeal to advance the interests of women, the American Association of University Women and other advocacy groups have distorted the achievements of women and the experience of girls and boys in schools. But what harm has been done, a sensible person might ask? Government agencies, foundations, and teachers have directed attention and resources to girls and have developed their skills in those areas where girls do lag behind, science and mathematics.

The myth that the schools shortchange girls, one might argue, is nothing more than what Plato called a "noble lie"—a falsehood in the service of a desirable political good (Plato, trans. 1942, pp. 302-304). But this noble lie, it turns out, is not so noble. It draws attention and resources away from the group the schools truly fail, African-American males. This lie has other, more insidious, effects on the culture of schools. The problem was evident in a workshop I attended for the teachers of gifted and talented students. I was on a panel with several school counselors. The moderator posed the question, "What can we do to help girls, who suffer such a loss of self-esteem at adolescence?" One of the counselors on the panel launched into a fiery description of the emotional problems of teenage girls. Girls she knew had changed from vigorous children who spoke their minds to bored and passive teenagers. This counselor was not aware that she was repeating the message of the AAUW report. These ideas had been promoted in workshops and education courses for years. They were just in the air.

I came next on the panel and thought about what I should do. Should I flat out contradict this counselor and tell the teachers in the audience that the research shows no important difference between teenage boys and girls in self-esteem, that this research has been politicized to make girls look like victims? As diplomatically as I could, I made these points. The counselor's reaction astonished me.

"I'm so glad you said that!" she proclaimed. "I know that boys have problems, too. But we just don't give the boys much attention."

Other teachers agreed, with a palpable sense of relief. "Come to think of it, I have four suicidal adolescents in my classes this year, and all four are boys," one said.

"Write a newspaper article about this. Get the word out," said the sole male teacher at the workshop. "We're too busy to read the professional literature. We didn't know this."

The school counselor bemoaning the problems of girls, it turned out, had actually developed a valuable program for teenage boys. She had invited a male graduate student from the university to talk with several troubled boys. The same boys who wouldn't talk to her, she observed, sprawled on the floor with this graduate student, talking with intensity. But she hadn't bothered to describe her program to the other teachers. Troubled boys were not on the list of topics important enough to discuss.

Indeed, boys came up only indirectly when the panel was given the question of what to do with bright students who complain that they are "bored" in school. I could tell that most of these students were boys from the teachers' examples. One described a boy, for example, who hated math class because the class was too slow for him. His teacher forced him to do pages of problems that he already understood. What was the solution? "Let bored students know that it is not acceptable to say 'I'm bored' to teachers," was the consensus of the school counselors. Figuring out a way to provide more advanced instruction in mathematics, for either boys or girls, was not on the agenda.

In the hectic, crowded world of the classroom, teachers have limited time, attention and energy. Teachers are concentrating on the problems of girls, but they are dismissing the problems of boys and neglecting the problem of how to educate the most gifted students. The focus on promoting female success gives the schools an excuse for ignoring their gravest failure with minority boys. The "noble lie" that the schools shortchange girls is not so noble, after all.

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The Myth That Schools Shortchange Girls:

Social Science in the Service of Deception

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Deceptive social science research has promoted a lie—the idea that the "schools shortchange girls." This deception has been deliberate, a political strategy designed to gain advantages for females and to promote the special interests of one group of beneficiaries, well-educated women, at the expense of groups that the schools truly shortchange, such as African-American males.

The American Association of University Women commissioned and publicized a public relations document masquerading as social science research, *How Schools Shortchange Girls: A Study of Major Findings on Girls and Education.* Through a sophisticated public relations campaign, this report has created the false impression that girls are ignored by teachers, suffer from low self-esteem, and lag behind boys in school achievement. Educated people now take these ideas for granted.

The facts are different. Girls excel in schools. Girls get higher grades in every school subject, get higher class rank, get placed half as often in special education classes, score significantly higher on standardized tests of writing and reading achievement, enter college more often, and graduate more often with bachelor's and master's degrees.

Girls do lag behind boys in advanced science and mathematics achievement. But this sex difference is far less dramatic than most people suppose. In fact, girls now take slightly more high school science and mathematics classes than boys do. At the end of high school, girls make almost the same scores on standardized tests of mathematics and science achievement. A significant sex difference in mathematics and science performance occurs only at the top. Females are less apt to rank among the most talented science and mathematics students, and they are less apt to obtain doctoral degrees in these fields.

Nonetheless, women have made dramatic gains in mathematics and science which the rhetoric of victimization has masked. Almost 40 percent of Westinghouse Science Talent Search Finalists are now women. Over 40 percent of the doctoral degrees awarded to Americans in the biological and life sciences now go to women.

The gender gap in mathematics and science has drawn enormous policy attention and great sums of federal and foundation monies have been devoted to closing this gap. This gap, however, affects very few people. The number of students, male and female, who got doctorates in mathematics in 1994 (450 males, 146 females) is dwarfed by the number who got law degrees that year (22,592 males, 16,757 females). Most ambitious women are seeking professional degrees, especially in law. In the professions, the gender gap has just about closed.

The claims that girls are "silenced" in the classroom and suffer a dramatic drop in self-esteem at adolescence wither under scrutiny. The most highly most publicized study showing that teachers ignore girls has mysteriously "disappeared." Careful studies of sex differences in classroom participation and self-esteem show no consistent pattern of female disadvantage.

To the surprise of no one who stops to think about it, studies reveal that some teenage boys, as well as some teenage girls, suffer from self-doubt. For most teenagers, self-esteem depends far more on personal appearance and popularity than on anything that goes on in schools. Where schools do influence self-esteem, it is girls who have the advantage. Both boys and girls agree by overwhelming margins, sometimes over 90 percent, that teachers think girls are smarter, compliment girls more often, like to be around girls more, and punish boys more often.

The charge that the schools shortchange girls is political propaganda, at best what Plato called a "noble lie"a falsehood designed to achieve desirable political goals. This "noble lie" is hardly noble. First, this lie draws attention away from the group that the schools actually do fail: African-American males, who fall far behind African-American females in educational success. Second, this lie masks the enormous educational progress women have made and prevents them from drawing self-confidence from their own success. Third, this lie leads teachers to focus on marginal goals like raising the self-esteem of teen-age girls, rather than on major goals like increasing the dismal performance of American students on international tests in mathematics and science.

Politics dressed up as science has a more subtle but no less corrosive consequence—undermining public confidence in social science research as a legitimate source of knowledge. "The Boy Who Cried Wolf" is an equal-opportunity fable.

Summary of Main Points

School Grades and Class Rank: Females Are Ahead

*** From grade school through college, females receive higher grades and obtain higher class rank.**

That females receive higher grades in schools has been reported across so many subjects, historical eras, and ethnic groups that many researchers treat this finding as axiomatic.

Achievement Test Scores: Females Are Ahead But Call It a Draw

*** At the end of high school, females surpass males in two academic areas: writing skills and reading achievement. Males surpass females in two academic areas: science and mathematics achievement.**

*** The female advantage in reading and writing is more than twice the size of the male advantage in mathematics and science (See Table 1).**

Table 1.

The Gender Gap Favoring Females in Reading and Writing is More than Twice the Size of the Gender Gap Favoring Males in Science and Mathematics

National Assessment of Educational Progress: End of High School (0 to 500)	**Males**	**Females**	**Gender Favored**	**Size of Difference**
Reading	279.9	294.4	**Females**	15 points
Writing	275	292	**Females**	17 points
Mathematics	310	305	**Males**	5 points
Science	300	292	**Males**	8 points

Source: *Digest of Education Statistics 1997* (Tables 107, 113, 118, 126) National Center for Education Statistics, Washington, DC: U.S. Department of Education.

Special Education: Males Are At the Bottom

*** Males end up at the bottom of the barrel in schools far more often than girls. Twice as many boys are assigned to special education classes.**

The startling numbers of boys in classes for the learning disabled and emotionally disturbed may result in part from teacher bias against rowdy boys. But males vastly outnumber females in many intellectual disorders with a clear biological foundation, such as autism (four males for every female).

* Males Are More Variable Than Females On Many Human Characteristics: Males Are More Apt To Be At the Top of the Heap and At the Bottom of the Barrel

On many human characteristics, males are more variable than females. Even if males and females have the **same** average, males spread out more. This means that males end up more often at the extremes—the top talent and the flaming failures.

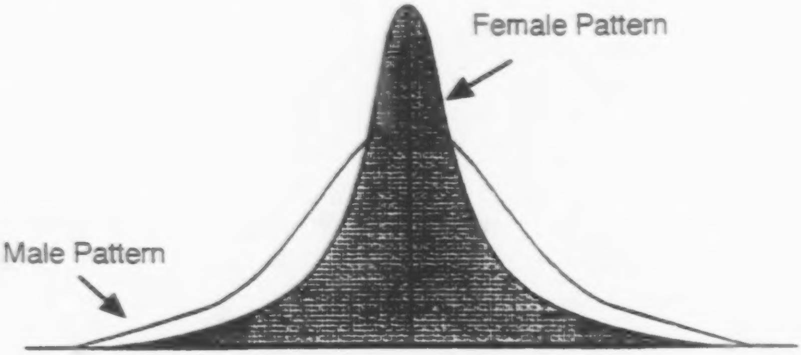


Illustration: Same Average, Different Variability

Mathematics and Science Achievement: Females Stride Ahead

* Females now take as many high school classes in mathematics and science as males do.

In algebra, geometry, biology, and chemistry, females take slightly more high school courses than males. For example, 59 percent of females take high school chemistry compared to 53 percent of males. Only in physics do females take slightly fewer courses (22%) than do males (27%).

*** More females are taking Advanced Placement tests in mathematics and sciences.**

Among students who take advanced placement tests in mathematics andthe natural sciences, 40 percent are now female.

Males continue to make higher scores, but the difference is far from overwhelming. The number of students qualifying for college credit in calculus, for example, was 12 per 1000 for males and 9 per 1000 for females.

*** Among Westinghouse Science Talent Search Finalists, the proportion of females in the top 40 finalists has steadily increased.**

In the 1940s, about 20 percent of finalists were female. In the late 1990s, almost 40 percent of the finalists were female.

*** Women now earn well over 40 percent of the doctorates in the biological and life sciences and almost a quarter of the doctorates in mathematics and the natural sciences.**

The increasing number of foreign students, mostly male, who receive mathematics and science doctorates from American universities has obscured the dramatic progress of American women.

Of doctorates awarded to American citizens in 1994, women received 43 percent of the doctorates in the biological and life sciences; 24 percent of the doctorates in mathematics; and 22 percent of the doctorates in the natural sciences.

*** The number of women whose careers and prospects are actually affected by the gender gap in mathematics and science doctorates is small.**

Only 450 American men got doctorates in mathematics in 1994, for example, compared to 146 women. If the United States equalized the numbers of men and women who received doctorates in mathematics and the physical sciences, fewer than 2000 women would be affected each year.

The plain truth is few people, men or women, seek mathematics and science doctorates.

College Success: Females Now Surpass Males

*** Women have become the majority of college students and earn the majority of bachelor's degrees.**

In 1996, women earned 55 percent of the bachelor's degrees and 55 percent of all master's degrees.

*** African-American women have left African-American men far behind in higher education.**

In 1996, African-American women earned 64 percent of the bachelor's degrees and 66 percent of the master's degrees awarded to African-Americans.

Professional and Doctoral Degrees: Women Are Closing the Gender Gap

*** Since the 1960s, women have leaped ahead in professional and doctoral degrees (See Figure 1).**

Women now receive close to 45 percent of professional degrees and doctoral degrees.

*** Most ambitious women seek professional degrees, especially in law, rather than doctorates in mathematics and science. In law, women are closing the gender gap.**

In 1994, 43 percent of law degrees and 39 percent of medical degrees went to women.

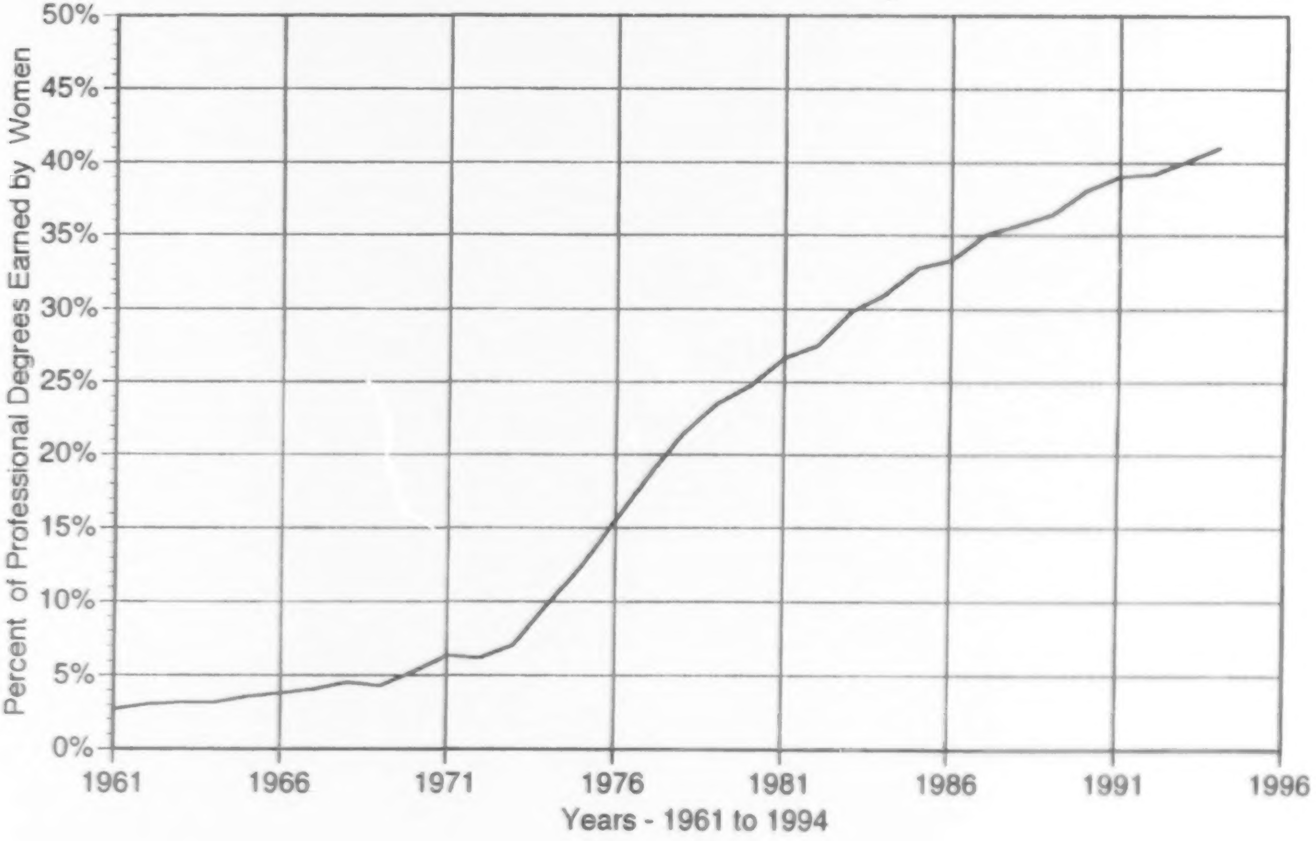
*** Women are earning more professional degrees than men in some fields.**

Women won the majority of professional degrees in veterinary medicine (65%), optometry (55%), and pharmacy (65%).

*** African-American women have surpassed African-American men in doctoral degrees and professional degrees.**

African-American women now receive 56 percent of the doctorates and 57 percent of the professional degrees awarded to African-Americans.

Figure 1
Women In 1994 Attained Almost Half of Professional Degrees, Up from Almost None In 1961



Professional degrees include law, medicine, theology, dentistry, chiropractic medicine, veterinary medicine, pharmacy, osteopathic medicine, optometry, and podiatry.

Source: National Center for Education Statistics, *Digest of Education Statistics 1996*, Table 239

Classroom Participation: Teachers Are Not Biased Against Girls

*** Sex differences in classroom participation are small and inconsistent.**

The much-publicized research done by David and Myra Sadker and highlighted in the AAUW report, a study claiming to show dramatic differences in teacher attention to girls and boys, has mysteriously been "lost."

Other studies of classroom participation show complicated patterns which differ from subject to subject and classroom to classroom.

In elementary schools, teachers give more attention to boys but most of this attention turns out to be disciplinary in nature. In high school mathematics and science classes, boys may indeed participate more than girls. Other studies show no gender differences in classroom participation and some show more academic attention going to girls.

No research shows any relationship between classroom participation and academic achievement.

*** When asked whether teachers give more attention to girls or boys, both sexes agree: Teachers favor girls.**

The following findings of sex bias against boys, not girls, come from a study that the American Association of University Women commissioned.

But this research, shown here, did not make it into their public relations report.

Table 2.

Boys and Girls Believe Teachers Give More Attention to Girls

Beliefs About School Environment	Boys' Perception	Girls' Perception
Who does teacher call on more often?		
Boys	36%	35%
Girls	59%	57%
Who does teacher pay more attention to?		
Boys	29%	33%
Girls	64%	57%

Source: Adapted from *Expectations and Aspirations: Gender Roles and Self-Esteem* (p. 18) by AAUW/Greenberg-Lake, 1990, Washington, DC: Greenberg-Lake.

Self-Esteem: Girls Suffer No Dramatic Decline in Self-Esteem at Adolescence.

*** Self-esteem is difficult to measure and the research is inconsistent. Some of the most careful studies show no differences between girls and boys in "self-esteem."**

ED 423 210 THE MYTH THAT SCHOOLS SHORTCHANGE GIRLS: SOCIAL SCIENCE IN THE
SERVICE OF DECEPTION.

2 OF 2 WOMEN'S FREEDOM NETWORK, WASHINGTON, DC.
KLEINFELD, JUDITH 98 96P.

The following example reveals the trivial sex differences on vague questions which advocacy groups trumpet as evidence for low self-esteem among teen-age girls.

Table 3.

Adolescent Boys and Girls Both Express High Levels of Self-Esteem

Belief		**Strongly Agree**	**Somwhat Agree**	**Total**
I feel that I have a number of good qualities.				
	Girls	67%	26%	**93%**
	Boys	70%	22%	**92%**
I am able to do things as well as most other people.				
	Girls	52%	35%	**87%**
	Boys	57%	30%	**87%**
I take a positive attitude toward myself.				
	Girls	49%	35%	**84%**
	Boys	59%	27%	**86%**
On the whole, I am satisfied with myself.				
	Girls	46%	35%	**81%**
	Boys	55%	29%	**84%**

Source: *The Commonwealth Fund Survey of the Health of Adolescent Girls,* 1997, New York: The Commonwealth Fund. Data tabulations provided by The Commonwealth Fund

*** Teachers boost the academic self-confidence of girls far more than boys.**

The American Association of University Women's own research belies its charge that the schools discriminate against girls. By startling percentages boys and girls agree: Teachers think girls are smarter, compliment them more, like them more, and want to be around them more.

The 1997 Metropolitan-Life survey of gender issues in the schools, based on recent national survey data, states flatly: ***"Contrary to the commonly held view that boys are at an advantage over girls in school, girls appear to have an advantage over boys in terms of their future plans, teachers' expectations, everyday experiences at school and interactions in the classroom."***